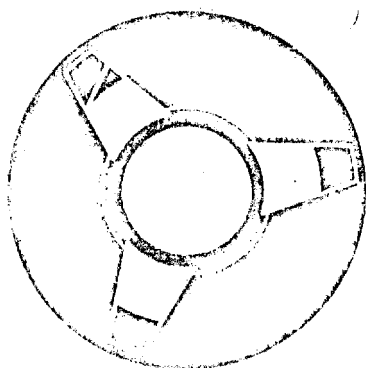


# OCS COMPUTER SYSTEMS PLANNING REPORT

1 June 1965



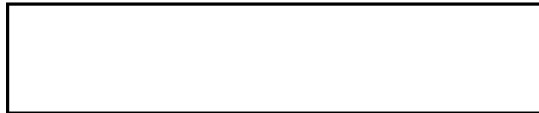
DIRECTORATE OF SCIENCE AND TECHNOLOGY  
OFFICE OF COMPUTER SERVICES

OCS COMPUTER SYSTEMS PLANNING REPORT

1 June 1965

DD/S&T Computing System  
Evaluation Task Team

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Contributors:

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## Chapter 1.

### STATEMENT OF PROBLEM, OBJECTIVES, AND SUMMARY CONCLUSIONS

#### 1.1. PROBLEM

The Office of Computer Services (OCS) was established in 1963 and now provides support to the four Agency Directorates. At the present time OCS operates five separate independent computer systems supplied by two different computer manufacturers. In late 1965 a sixth system will be added of yet another type. The total staff to program and operate this equipment now numbers [ ] This total staff is occupied in the management, supervision, analysis, programming, coding, checkout, data preparation, operation, and administrative support for this computer complex. STAT

The aggregate new purchase price of the presently installed equipment is approximately [ ] The programmers are provided with 19 different programming languages/operating systems. The training program is formidable. The program maintenance and documentation problems are staggering. The programming experience interchange and reinforcement is minimal. Most line programmers are unable to maintain current competency in more than one of these programming languages at STAT

a time. Thus, management is severely inhibited from assigning programmers to projects in response to the urgent needs of the Agency since an "unlearning" and retraining period is required before a man's experience can be transported across machine lines.

Similar to the case mentioned above, program interchangeability is likewise difficult. Although a program may be written in FORTRAN, it is very difficult to operate that program on the 1410 if the program was originally intended for the 7090. The FORTRAN expressions for these two machines are related but not identical; and the two operating systems are extremely different. The commonality between the two computers is limited to their tape drives and their point of manufacture. Both the 1410 and 7090 use the 1401 computer for large volume input/output processing. Thus, if a backlog overwhelms the 7090, the 1410 is of slight use in reducing it. An even worse condition exists when a peak load strikes the RCA computers because the IBM equipment is of no value whatsoever in reducing this peak to satisfy the service requirements.

The Computer Center is operated three shifts a day,

including most weekends. During the day shift the interplay between operations and the programmers and customers is the greatest when these "users" are bringing work to the center to be processed or are picking up work that has been completed. At that time operations personnel and "users" get involved in discussing problems encountered during processing, priorities, status of jobs, etc. The second and third shifts handle the larger production jobs and these shifts manage to finish most of the priority work each day. The weekends are used for severe backlogs or special operations requirements. Chapters 2, 3, and 4 provide additional details on how the present computers are utilized, the on-going jobs, and anticipated increases in workload by project, respectively.

According to best projections, our workload will quadruple in the next five years, even without any additional pressures toward centralization from management or the Bureau of the Budget. To attempt handling this increased workload with additional equipment of the present types and manufacturers would be grossly expensive and shortsighted. To handle this additional workload with our personnel committed to so many different computer systems would be patently impossible. It is not feasible to obtain the required number of billets,



to staff and train sufficient personnel, and to operate such multiple systems efficiently. To manage such a diverse work force would be most difficult, if not impossible, over the long run.

## 1.2. REQUIREMENT

From a study of the applications, both present and contemplated, a series of requirements emerged. First, the Agency requires a wide variety of storage devices of several types depending on the volume of information to be stored and the necessary response time to programmed commands. In addition, the predicted workload will involve situations where data files will be held on-line in magnetic form so that they may be interrogated remotely from consoles within the building. The response to these queries will be printed as directed by the interrogator, provided: (a) he has properly identified himself, (b) has previously established his authorization to access the information he desires, and (c) the electrical connections to the console are appropriately secure.

The present computer equipment can only be operated in the "batch" mode. Requests for information are now transported to the Computer Center where they are key punched and

manually scheduled. As appropriate to their priority (and the Center's work-load at the time of scheduling), runs are made and output is obtained. Such outputs usually take the form of magnetic tape which subsequently must be scheduled and printed. After hard copy is thus obtained, the necessary control and bookkeeping measures are satisfied, and it is finally transported back to the user. While this cycle can be completed in an hour or less for high priority small volume requirements, the dislocation to the remaining workload in the Center is such that 24 to 36 hours are frequently required for recovery. As the requirements increase for reduced turnaround time on request, such schedules will become completely untenable. Clearly a superior way must be found to satisfy the needs of the Agency.

### 1.3. OBJECTIVES

In order for the OCS to meet the expanding computer support needs of the Agency, certain objectives become clear.

a. Select one set of hardware and software so that management problems in training, personnel assignments, documentation, etc., are minimized.

b. Provide equipment with large capability for growth without reprogramming as hardware capabilities are expanded.

c. Provide equipment with the ability to utilize remote consoles for interrogation of files, programming, debugging, program execution, etc.

d. Provide equipment (including foreseeable expansion) that would fit inside the present Computer Center area.

e. Provide the best software in terms of programmer and operator efficiency.

f. Provide equipment that will assure the Agency of computer capability on a 24-hour-a-day, 7-days-a-week basis.

#### 1.4. EQUIPMENT SELECTION

Starting in early 1965, the OCS Technical Staff conducted evaluations of candidate computer systems. The capabilities of equipment (and software) which is available from the leading manufacturers were measured against the Agency's requirements. Major consideration was given to the systems offered by CDC, G.E., Honeywell, IBM, Remington Rand, and RCA, (A detailed technical evaluation paper is referenced in Chapter 11). Some of these vendors were eliminated simply because they did not offer the complete range of equipment (storage devices, display units, etc.) required to fulfill Agency needs. Others were eliminated

because their software (a most critical element) was not sufficiently developed and documented to allow adequate evaluation. And some, being more competitive, were eliminated on the basis of a price-performance index. Finally, two computer systems emerged for consideration in our most detailed evaluation: the GE 636 and the IBM 360/67. The IBM 360/67 was selected for the following principal reasons:

a. Unit-of-work processing cost is lowest on the 360/67.

b. The IBM 360/67 is a variable word-byte oriented system --- ideal for the OCS job mix of 75% data processing and 25% scientific computing.

c. While the effectiveness of both systems hinges on the development of extensive new hardware and software, there is much stronger ground for confidence in IBM's ability to produce. (The 636 is GE's first venture in a really large scale computer system).

d. IBM offers a much larger variety of random access devices.

e. IBM technology is more advanced, i.e., the 360 equipment is micro-electronic while the 636 is limited to earlier type transistorized components.

f. IBM has already documented more advanced software than GE.

The OCS Task Team, which concentrated on this problem, concluded that the IBM 360 offers sufficient capability and breadth to satisfy Agency requirements now and in the foreseeable future. The conversion task will be less arduous than if some other manufacturer had been chosen. Finally, the IBM equipment will fulfill Agency needs, both present and future, with a minimum of expenditures both for equipment and personnel.

#### 1.5. PURCHASE VERSUS RENTAL

In considering the acquisition of new computing equipment, the question of purchase versus rental is always raised by Agency management, BOB and others. From the viewpoint of OCS management, rental is generally preferred and we believe justified. The only advantage of purchase is the possibility of economic savings that might be realized by the Government as a whole. Actually, it is a severe handicap to a component charged with reacting to the broad dynamic requirements of intelligence collection and production problems.

An OCS paper on the merits of purchase vs. rent of the

proposed hardware is referenced in Chapter 11. It notes how difficult it is to predict what components are going to survive for 4-5 years (the approximate break-even point) in the rapidly developing world of micro electronics. At this time, it can only be recommended that all of the proposed hardware be rented. This problem will remain under most serious surveillance by OCS as it progresses with the evolution of its advanced systems.

#### 1.6. THE PROPOSED PLAN

A progressive schedule of equipment installations has been devised which will provide for staff retraining and continuing progress with a minimum dislocation of current operations. The final basic expansible system will be installed in the summer of 1967 and it is detailed in Chapter 5. It consists of a Model 67 Computer with twin Central Processing Units from the IBM System 360 family. These CPU's will be inter-connected in such a manner that the system will recover rapidly from all single hardware failures and may recover rapidly from many complex hardware malfunctions. (This is a "fail-soft" feature of the new system). Therefore, the availability of the system will approach 100% so that the automated files will be available for query and response 24-hours-a-day, seven-days-a-week.

It is envisioned that the proposed system be operated in the following way. The majority of the program preparation will be done in the present traditional manner. However, run requests will be fed directly to the computer for automatic scheduling (rather than manual scheduling, as at present), the computer will read new information into its memory, interpret control cards describing the job and its priorities, perform the required scheduling, and store the job (both program and data) on a direct access storage device. When the job in question has risen to the top of the queue so that it is scheduled for execution, the software required will be fetched from disk storage and the job will be executed.

If an interrogation is received from a remote location during this processing period, the processing will pause temporarily while the query is interpreted and its response is being prepared. The system currently contemplated will be able to handle console activity from several dozen consoles without appreciably slowing down the processing of the background job which is in progress.

If the query from the console requires a significant amount of processing before the response is available, then

a new task will be established, automatically scheduled, entered into the queue for processing at the appropriate point, and executed in due course. Under this condition there will, of course, be an indeterminate delay at the console due to the queue length and processing required.

The system, as contemplated, will allow programmers to prepare and check out new work in the "background". At least one of the two processing systems will be constantly available (within the limitations mentioned earlier) to service queries from the remote stations and to enter jobs as appropriate into the queue. Any additional time available on one processor will be used for executing background jobs. Normally one of the dual computers will be solely dedicated to performing background production work. In the event of a malfunction on either system, the surviving processor will immediately assume the console load while the throughput of background is reduced until the machine that failed is repaired. This is a limited form of time-sharing which seems to be well-suited to the needs of the Agency and the abilities of its programming staff. At some future date, as the programming staff becomes proficient in the mode of operation outlined above, and as the current developments in time-sharing mature, additional capabilities will be



provided. These capabilities may encompass on-line interaction for data preparation and editing, reactive consoles to augment and assist the programmer in the preparation of new program modules, etc.

#### 1.7. SUMMARY CONCLUSIONS

The plan outlined in this report fulfills the objectives stated above. It has incorporated into it all the latest hardware and software features. The throughput cost is the best available. It has outstanding growth possibilities without additional reprogramming. An almost unlimited number of consoles are feasible. Due to the duplication of key hardware, its off-the-air time should be nearly zero.

The implementation timing set forth in the plan is quite optimistic but an ambitious schedule is necessary in response to the problem faced by the Agency. It will require prompt reaction by OCS and Agency management when problems are encountered. It will require a determined, forceful push by all people involved in meeting their hardware, software dates.

Slippage in the proposed schedule is to be expected and may not be too damaging. Even if the proposed plan is slipped by some months OCS will still attain, early in the remote console era, a pre-eminent position to support the Agency

in its critical mission.

Unless a plan such as this is carried out, it will be impossible for OCS to provide the automatic data processing support that the Agency clearly needs.

## Chapter 2

### PRESENT SYSTEM ANALYSIS

#### 2.1. HARDWARE

As of 1 June 1965 computer equipment installed in the CIA Computer Center consists of the RCA 501, RCA 301, IBM 7090, IBM 1410, IBM 1401, and related peripheral equipment such as a CalComp Digital Incremental Plotter, and a Digi-Data Paper Tape-to-Magnet Tape Converter. A small number of card processing machines and data preparation machines such as card punches and verifiers are also employed. Costs of these systems are detailed in the following system description.

##### 2.1.1. Historical Perspective

In planning ahead for new computer equipment it is perhaps well to look back over the history which brought us to the present computer complex.

One of the first uses of automatic data processing equipment in the Agency was in the administrative and accounting fields. Applications in these areas are frequently referred to as "business applications" and they include such

applications as Payroll, and Accounting in support of Personnel, Supply, and Finance. From the very beginning of the Agency, these applications were performed on IBM punched card equipment. In October 1960, the RCA 501 computer was installed for these applications. The objectives in the installation of this equipment were to improve the speed, flexibility, and costs of processing "business applications". In the process of phasing in the RCA computer, substantial amounts of card processing equipment were released and card processing applications were switched to the computer.

Generally speaking, the computer reduced the number of operators but increased the number of people in planning activities, i.e., system analysis, design, and programming. While the speed of processing was significantly improved once a job was fully converted and checked out on the computer, more thorough requirements analysis and a longer planning period were needed for programming and job setup. Often the overall time spent on new jobs or applications was quite lengthy.

Mechanically, the RCA input/output equipment was less than satisfactory. The printer was serviced extensively but failed to provide "on register" print lines. The card

transcriber also appeared to be below normal standards of reliability. As a result the Agency ordered an IBM 1401 for input/output processing. Shortly before this installation was to take place, the announcement of the RCA 301 computer with IBM card reader punch and an improved printer resulted in its acquisition vice the IBM 1401. The compatibility of the RCA 301 with the installed RCA 501 and its lower costs were additional contributing factors to this decision. The RCA 501 and RCA 301 are used more than any other systems in the CIA Computer Center; their average usage is 565 hours per month and 490 hours per month respectively.

In January 1963 the IBM 1410 and IBM 1401 systems were installed. These systems provided the capability of editing, sorting, and listing large files of data. Intelligence files and special projects in the DD/I area which had not previously been considered feasible on EAM equipment provided the principal volume of work for these systems. Later, new "business applications" in the DD/S area began to add significantly to the workloads, a case in point being the [ ] project.

Utilization of the IBM 1401 and IBM 1410 averages 440 hours and 547 hours per month, respectively.

In July 1963, the IBM 7090 was installed to fill the need for a large-scale scientific computing capability. One of the great benefits of this particular computer was the easy acquisition of many operational IBM 7090 programs developed by other users in the aerospace, intelligence, and scientific fields. Utilization of this system averages 500 hours per month.

#### 2.1.2. Peripheral Equipment

The CalComp Digital Incremental Plotter System and the Digi-Data Paper Tape to Magnetic Tape Converter are representative of peripheral equipment purchased to provide a unique capability. The plotter has been used both for plotting telemetry data in analog form and for statistical graphs. The paper tape converter has been used primarily for project Electronic Printing of Intelligence Composition (EPIC) and for

#### 2.1.3. Incompatibility

The problem of compatibility of data and computer hardware occurs between the RCA and IBM equipment. Magnetic tapes are not interchangeable between these systems and the only communication between these computers is through punched cards.

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The CalComp Plotter and the Digi-Data tape converter are IBM compatible. In the near future an IBM compatible tape unit will be installed on the RCA equipment to facilitate communication between RCA and IBM systems. This will provide a means for eventual conversion of RCA data for processing on IBM equipment.

2.1.4. Equipment Installed June 1965

Five computer systems are installed and in operation as of June 1965. These systems operate as independent computers and the work flows through them in sequence as required. They share tape drives so that the configuration is somewhat adaptive to the work load via a series of manually operated tape switches. Both the IBM and the RCA equipments are connected in this way.

The dollar figures given in the following statements are for single shift monthly rental and include costs for single shift maintenance where components have been purchased. This is not the full amount paid to the vendor in any one month. The figures given are the rental for 176 hours of usage in a calendar month, if no extra shift is required. However, the total usage measured from the time recording meters is approximately two full shifts. This increases the rental by

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approximately [ ] Thus our actual rent paid to vendors  
STAT is [ ] per month.

2.1.4.1. IBM 7090

This is a binary, 36-bit word-oriented parallel transfer computer designed for scientific data processing. The system has 32K words of 36 bit memory, a memory cycle time for 2.18 microseconds per word, two independent I/O channels, limited card I/O, and 11 magnetic tape drives, one of which is shared with the 1401. It was installed in August 1963, has one purchased component and a net basic cost of . . . . . [ ]

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2.1.4.2. IBM 1410

This is a decimal, 6-bit character-oriented machine with some parallel operation for commercial data processing. The system has 80K characters of 6 bits each, a memory cycle of 4.0 microseconds per character, two independent I/O channels, fast card I/O and 10 tape drives, one of which is shared with the 1401. It was installed in January 1963, has no purchased components and a basic cost of . . . . . [ ]

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2.1.4.3. IRM 1401

This is a decimal, 6-bit, character-oriented machine with no parallelism. It is used for both primary input and output and for limited commercial data processing. The system had 8K characters of 6 bits each, a memory cycle time of 11.5 microseconds per character, fast card I/O, and two tape drives, both of which may be shared. It was installed in January 1963, has no purchased components and a basic cost of . . .

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2.1.4.4. RCA 501

This is an octal, 6-bit, character-oriented machine with limited parallelism. It is used for commercial data processing. The system has 32K characters of 6 bits each, a memory cycle time of 12 microseconds per 4 six bit characters, no card I/O, and 8 tape drives, one of which is normally assigned to the RCA 301. It was installed in October 1960, has three purchased components and a net basic cost of. . . . .

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\* These costs allow for 7 tape drives on 501 system and 1 tape drive on the 301 system.

2.1.4.5. RCA 301

This is a decimal, 6-bit, character-oriented machine with no parallelism. It is used both for primary input and output and for limited commercial data processing. The system has 10K characters of 6 bits each, a memory cycle time of 7 microseconds per character, fast card I/O and one tape drive permanently assigned. It was installed in November 1962, has no purchased components and a basic cost of . . . . .

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The total net basic monthly cost of the 5 systems is. . . . .

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2.2. SOFTWARE

OCS has five different computers each of which uses a different programming language. COBOL provides a theoretical compatibility among the RCA 501, IBM 7090 and the IBM 1410. However, until 1964 the RCA 501 COBOL had a very inefficient compiler and in practice was not used because of excessive compile time. Although COBOL compile speeds are good on the IBM 1410 and 7090, actually little exchanging of programs is done because of the hardware incompatibilities:

the 1410 is variable length and decimal while the 7090 is fixed word and binary. In addition, inconsistencies exist in the compilers so that programmers become discouraged from interchanging COBOL programs among machines.

The FORTRAN II used on the IBM 1410 is not completely compatible with the FORTRAN II available for the IBM 7090. In addition, the obsolete FORTRAN II has been replaced by FORTRAN IV on the IBM 7090.

The IBM 1401 programs may be run on the IBM 1410 using the hardware compatibility feature. This use requires interruption of the flow of work using the 1410 Operating System and does not exploit multiple channels and overlap features of the 1410.

#### 2.2.1. 7090 Software

IBM 7090 IBSYS V-12B is the standard operating system in OCS. It includes FORTRAN IV, COBOL, SORT, 9PAC, COMIT, FORTRAN II, FAP, MAP, ASP, SUPPAC, and various math and CALCOMP subroutines. No remote interrupt capability or interrupt features for multiprogramming or time-sharing exist without extensive hardware modification.

The system contains a batch processing monitor which provides some powerful specific features. The IBSYS monitor is the most used monitor system in the world, and its construction reflects its position in the historical evolution

of monitors. It was one of the first large monitors and thus reflects some primitive concepts of design. Also, because of its wide use by the majority of the large-scale scientific computer users in the world, it incorporates powerful features to do scientific computing tasks under the batch mode. IBSYS as a system is rapidly becoming obsolete, and IBM is no longer actively supporting research for major improvements. Incidental improvements will continue through users and through the users' organization, SHARE.

Very little practical possibility exists to adapt the IBM 7090 to a time-sharing, remote console, real-time environment. The software does not exist, and could not be written without extensive modifications to the hardware. The product would, at best, be obsolete and uneconomical by state of the art standards.

#### 2.2.2. 1410 Software

PR-155, the current OCS 1410 system, includes AUTOCODER, SORT/MERGE, FORTRAN II, and COBOL. The batch monitor is well designed but lacks some of the features of IBSYS. The hardware does not provide the interrupts for next era computing and no amount of software modification can bring the total system to the state of the art for 1966-67. Analysis of the internal implementation indicates many com-

promises in order to get the system working. For example, the FORTRAN compiler is basically a simulation of the 7090 instead of being designed for the IBM 1410. At the present time, it is considered a smooth system, but its long range possibilities are nil.

#### 2.2.3. 1401 Software

This is a small non-monitored system designed for I/O support. No future potential exists.

#### 2.2.4. 501 Software

The 501 software package contains an EZCODE assembler, two COBOL Compilers, two Sort/Merge packages, and a Sequencer (monitor). The RCA 501 COBOL compiler is inefficient, and the assembler is considered primitive. RCA has not produced first-class software for its hardware, which is generally considered to be reliable and to have a good, powerful instruction set. It is highly unlikely that RCA will produce acceptable software for the RCA 501 at this late date.

#### 2.2.5. 301 Software

This non-monitored system is designed for I/O support. No future potential exists.

#### 2.2.6. Manuals/Training Materials

Most OCS programmers know at least one machine well and are familiar with at least one other machine. Thus,

each possesses, or must have closely available, at least two sets of manuals. A master notebook containing all manuals for each major machine is kept in appropriate OCS offices and this notebook is maintained by the Technical Staff. Considerable time is spent in keeping these notebooks up to date. The master copy of this set of manuals and notebooks requires approximately 80 linear feet of storage space. A significant amount of this footage deals with low level languages.

Training materials are extensive. The Technical Staff has course outlines, manuals, tests, and sample problems for a variety of languages. The preparation of frequent seminars to deal with hardware/software incompatibilities has used many hours of top technical talent.

### 2.3. OPERATING STATISTICS

Each computer center keeps operating statistics to control its own internal processes. These are used by the computer center management to review operations for budgetary purposes, to anticipate hardware overloads based on established growth patterns, to provide a measure of the support furnished to various customers and projects, to show the way the computer was used (test, debug, production, maintenance, etc.). Our internal accounting is based on manually-kept

records. At present, time-of-day clocks are not installed on four of the five computer systems; therefore, the operating systems may not interrogate them. The system proposed in Chapter 5 will have integrated accounting and record keeping completely under the control of the operating system. This will relieve the operating personnel of one task which sometimes suffers in the attempt to keep the equipment operating.

#### 2.3.1. Directly Chargeable Hours

The table that follows gives a breakdown of hours by computer that can be directly charged to the four Directorates served. These hours do not include such overhead hours as idle, training, demonstration, software maintenance, and hardware maintenance.

COMPUTER HOURS CHARGEABLE TO SUPPORT THE DIRECTORATES

(February 1965 through May 1965)

Computer System	DD/I	DD/S	DD/S&T	DD/P	Total
IBM 7090					
IBM 1410					
IBM 1401					
RCA 501					
RCA 301					

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2.3.2. 7090 Utilization

For the four-month period February-May 1965 the IBM 7090 computer system was in use for the hours shown. The totals in this table exceed the summary totals given in section 2.3.1. due to certain computer hours which are classed as overhead to computer operations.

HOURS OF 7090 USAGE BY ACTIVITY

February through May 1965

ACTIVITIES	FEBRUARY	MARCH	APRIL	MAY	TOTAL
Production	252	199	278	256	985
Development	126	110	148	174	558
Setup	72	79	92	85	328
Maintenance	32	37	28	38	135
Idle	80	135	50	65	330
Total	562	560	596	618	2336

2.3.3. 1410 Utilization

For the four-month period the IBM 1410 computer system was in use for the hours shown. The totals in this table exceed the summary totals given in section 2.3.1. due to certain computer hours which are classified as overhead to computer operations.

HOURS OF 1410 USAGE BY ACTIVITY

February through May 1965

ACTIVITIES	FEBRUARY	MARCH	APRIL	MAY	TOTAL
Production	220	310	314	278	1122
Development	122	162	145	152	581
Setup	77	77	79	78	311
Maintenance	47	28	63	35	173
Idle	55	49	33	26	163
Total	521	626	634	569	2350

2.3.4. 1401 Utilization

For the four-month period the IBM 1401 computer systems were in use for the hours shown. The totals in this table exceed the summary totals given in section 2.3.1. due to certain computer hours which are classed as overhead to computer operations.

HOURS OF 1401 USAGE BY ACTIVITY

February through May 1965

ACTIVITIES	FEBRUARY	MARCH	APRIL	MAY	TOTAL
Production	174	191	225	197	787
Development	115	177	154	121	567
Setup	69	102	100	91	362
Maintenance	15	5	14	12	46
Idle	188	137	103	152	580
Total	561	612	596	573	2342

2.3.5. 501 Utilization

For the four-month period the RCA 501 Computer system was in use for the hours shown. The totals in this table exceed the summary totals given in section 2.3.1. due to certain computer hours which are classed as overhead to computer operations.

HOURS OF 501 USAGE BY ACTIVITY

February through May 1965

ACTIVITIES	FEBRUARY	MARCH	APRIL	MAY	TOTAL
Production	330	322	340	400	1392
Development	72	110	94	70	346
Setup	56	62	51	61	230
Maintenance	72	84	69	77	302
Idle	41	35	36	46	158
Total	517	613	590	654	2428

2.3.6. 301 Utilization

For the four-month period the RCA 301 computer system was in use for the hours shown. The totals in this table exceed the summary totals given in section 2.3.1. due to certain computer hours which are classed as overhead to computer operations.

HOURS OF 301 USAGE BY ACTIVITY

February through May 1965

ACTIVITIES	FEBRUARY	MARCH	APRIL	MAY	TOTAL
Production	296	308	267	296	1167
Development	128	143	131	165	567
Setup	40	36	29	33	138
Maintenance	18	27	16	21	82
Idle	89	99	147	139	474
Total	571	613	590	654	2428

### Chapter 3.

#### CURRENT PROJECTS

The recurring production jobs are enumerated in this chapter. One-time jobs, internal scheduling and monitoring, training runs, and computer support development efforts (which in the aggregate involve a large amount of computer time) are not itemized. These figures are a further breakdown of the production totals shown in Chapter 2.

#### 3.1. SCIENTIFIC COMPUTING

Following is a summarization of the present scientific computing workload. The workload is subdivided by type, followed by an explanation of the activity, customers, average machine usage per month, etc.

##### [ 3.1.1.

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3.2

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3.2.3

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### 3.3. MANAGEMENT DATA PROCESSING

On-going jobs which serve the Support Directorate are summarized below. Projects, customers, and machine use hours are given and each job is explained briefly. Preliminary work is underway on the development of a new Management Information System (MIS).

#### 3.3.1. Agency Training Record (ATR)

The customer for this activity is OTR. In a typical month it accounts for 3.3 hours of 501 time and 3.0 hours of 301 time. Records of Agency-sponsored training are maintained.

#### 3.3.2. Badge File

The customer for this activity is OS. In a typical month it accounts for 2.5 hours of 501 time and 1.0 hours of



301 time. Current lists of assigned badges and areas of clearance are provided for the Badge Office and Night Security Office.

3.3.3. Case Processing Analysis (CAPER)

OS/SRD is the customer for CAPER. In a typical month it accounts for 3.1 hours of 1410 time and 2.1 hours of 1401 time. The computer product serves for analysis of elapsed time on pending clearance cases within divisions.

3.3.4. Special Clearance Center Activity Analysis (SPECLE)

The customer for SPECLE is OS/SCC. In a typical month it accounts for 19.7 hours of 1410 time and 4.5 hours of 1401 time. It processes data for analysis of activity on security clearances.

3.3.5. Medical Staff Test Evaluation

The customer served is OMS/AES. In a typical month, it accounts for 13.2 hours fo 501 time and 8.2 hours of 301 time. The machine function is to score, report, and store results of psychological test batteries.

3.3.6. Vouchered Payroll

The customers are OF, OP, and OBPAM. In a typical month it accounts for 3.0 hours of 1401 time, 44.4 hours of 501 time,

and 67.8 hours of 301 time. The operation is to maintain payroll records and produce salary checks, statements of earnings, deductions, leave balances, and W-2's; provide payroll accounting back-up and audit details, furnish information on excessive use of sick leave, compile data on overtime payments, and produce LWOP accumulations.

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3.3.8. Individual Earnings Records

The customer is OF. In a typical month it accounts for 10.0 hours of 501 time and 1.0 hours of 301 time. Pay period records of all personnel and payroll actions on pay, earnings, and deductions are provided.

3.3.9. Cable Traffic Analysis (CATRAN)

The customer of CATRAN is OC. In a typical month it accounts for 3.2 hours of 1410 time and 0.1 hours of 1401 time. It provides statistics on cable traffic for planning personnel requirements, equipment, circuit requirements, etc.

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3.3.12. Logistics Stock Accounting

The customer for this activity is OL. In a typical month it accounts for 80.0 hours of 501 time and 66.0 hours of 301 time. Maintenance of a Master Property File (i.e., stock level and account of property) is provided.

3.3.13. Manufacturers Cross Reference

OL is the customer for this activity. In a typical month it accounts for 6.0 hours of 501 time and 2.0 hours of 301 time. It supports the Defense Logistics Supply Center federal cataloging function.

3.3.14. Forms Control

The customer for this activity is DD/S (Agency-wide distribution). In a typical month it accounts for 2.0 hours of 501 time and 2.0 hours of 301 time. It provides complete documentation of Agency forms.

3.3.15. Personnel System

The customers supported by this system are OP, OBPAM and Credit Union.

3.3.15.1. Agency Language Proficiency Program

In a typical month this operation accounts for 3.7 hours of 501 time and 1.6 hours of 301 time. It provides language proficiency data for Agency staff employees.

3.3.15.2. Agency Personnel Qualifications Systems

In a typical month this system accounts for 7.1 hours of 501 time and 2.5 hours of 301 time. It is an information system pertaining to skills, experience, training, and education of Agency personnel.

3.3.15.3. Agency Strength Accounting

In a typical month this activity accounts for 2.0 hours of 501 time and 0.8 hours of 301 time. It provides official Agency strength reports.

3.3.15.4. Employee Locator

In a typical month this activity accounts for 2.3 hours of 501 time and 3.1 hours of 301 time. This is a locator system for information on personnel; also used to prepare Agency telephone directories.

3.3.15.5. Fitness Reports Processing

In a typical month this activity accounts for 1.5 hours of 501 time and 0.5 hours of 301 time. The operation supports the Agency's Fitness Report Program.

3.3.15.6. Hospitalization Master

In a typical month this activity accounts for 2.2 hours of 501 time and 0.4 hours of 301 time. Current records or personnel enrolled in health benefit plans are maintained.

3.3.15.7. Project MANS

In a typical month this project accounts for 1.7 hours of 501 time and 1.0 hours of 301 time. It is an automated system to align T/O positions with budget programs, activities, categories, etc.

3.3.15.8. Periodic Step Increases

In a typical month, 2.4 hours of 501 time and 1.4 hours of 301 time are accounted for. It is a computerized call-up and control mechanism in support of periodic step increases.

3.3.15.9. Personnel Archives Project

In a typical month this project accounts for 2.1 hours of 501 time. It furnishes historical back-up for the Statistical Reporting Branch (SRB).

3.3.15.10. Insurance File

In a typical month this activity accounts for 0.4 hours of 501 time. Listings of various insurance policy accountings are furnished to the Insurance Branch.

3.3.15.11. Record of Overseas Service

In a typical month this activity accounts for 0.9 hours of 501 time and 0.3 hours of 301 time. It is a central file of data on personnel who have served overseas.

3.3.15.12. Statistical and Related Reports

In a typical month this system accounts for 10.0 hours of 501 time and 4.1 hours of 301 time. It is a record keeping reporting system.

3.3.15.13. Temporary Definite Status (NTE)

In a typical month NTE accounts for 0.9 hours of 501 time and 0.4 hours of 301 time. Records of all Agency employees designated as NTE--"Not to Exceed" are maintained.

3.3.15.14. T/O Related Processes

In a typical month this activity accounts for 11.8 hours of 501 time and 15.6 hours of 301 time. Its function is to maintain records reflecting job-to-incumbent relationship.

3.3.15.15. Credit Union Rosters

In a typical month this program accounts for 3.5 hours of 410 time. It produces data for maintaining individual ledger records, a reference aid, and source of information.

3.3.15.16. CIA Retirement System

In a typical month, this system accounts for 2.0 hours of 1410 time and 1.0 hours of 1401 time. Rosters are prepared to aid the Career Services in the selection of personnel eligible for retirement.

3.3.15.17. Agency Early Retirement System

In a typical month this system accounts for 0.2 hours of 501 time and 0.1 hours of 301 time. It supports the Agency's Early Retirement Program.

3.3.16. Accounting System

The customers for this system are OBPAM and OF. In a typical month it accounts for 109.0 hours of 501 time and 66.0 hours of 301 time.

### 3.16.1. Budgetary Accounting

Data in various financial files are processed for OBPAM to determine project costs, budget projections, and program analysis.

### 3.3.16.2. Daily Accounting

Original accounting entries are listed to support source documents and furnish statements of advance accounts, and cash accounts.

### 3.3.16.3. Financial Analysis Number (FAN)

The purpose is to maintain a file of valid FAN accounts, print the FAN Directory, support program analysis and budget preparation, and eliminate manual posting of records in Agency offices.

### 3.3.16.4. General/Subsidiary Ledger Accounting

To process transactions for the general/subsidiary ledgers, to prepare various listings for analysis by the Office of Finance, and to maintain accounts.

### 3.3.16.5. Obligation, Expenditures, Issue, and Cost Reporting

The computer is used to prepare listings and reports for analysis of control of expenditure, issue, and cost data.



3.3.16.6. Reciprocal and Reconciliation Accounting

The function is to maintain accounts and furnish detailed information for the reciprocal and reconciliation accounts.

3.4 COMMO OPERATIONS SUPPORT

OCS is supporting the Office of Communications with several on-going computer projects which are listed below.

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## Chapter 4

### PROJECTED WORKLOAD

This chapter deals with monthly increases over the present computer workload which, though excessive to on-hand hardware capabilities, can be accommodated by the planned system. Required computer time is shown in terms of present hardware where feasible. However, projected requirements which cannot be handled on present type hardware are estimated for third generation hardware of the required capability.

#### 4.1. SCIENTIFIC COMPUTING

A large part of the projected growth in the computer workload as of the end of 1968 is attributable to increased activity on scientific computing jobs which are already operational. The total increase in scientific computing time is estimated to be over 646 hours on the 7090.

##### 4.1.1. Air Defense System Simulation

The customers for this activity are OSI and the Office of the DD/S&T. The projected growth in workload on this activity will require an additional 32 hours of 7090 time and 26 hours of 1401 time. The computing work relates to [

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4.3. MANAGEMENT DATA PROCESSING

By the end of 1968 the projected increase in computer use time required to handle the planned growth in management support jobs totals 24 hours of 501 time, 25 hours of 301, 275 hours of 1410, and 1.1 hours of 360/65 per month.

4.3.1. Badge Office Files Consolidation Study

The customer for the Badge Office Files Consolidation

Study activity is the Building Security Branch, OS. The projected growth in the workload on this activity will require an additional 18.0 hours of 1410 time. The computing work relates to consolidating six small files presently held by the Badge Office.

#### 4.3.2. Biographic Profiles

The customer for the Biographic Profiles activity is the Office of Personnel. The projected growth in the workload on this activity will require an additional 14.0 hours of 501 time. The computing work relates to preparing clear text profiles from data taken from the Agency Central Qualification File and other related personnel files.

#### 4.3.3. Junior Officer Trainee Program

The customer for the Junior Officer Trainee Program is the Office of Personnel. The projected growth in the workload on the activity will require an additional 4.0 hours of 501 time and 2.0 hours of 301 time. The computing work relates to establishing and maintaining a magnetic tape record reflecting all action taken with respect to personnel in the program--past or present.

4.3.4. Contract Accounting and Reporting System (CONARS)

The customer for the Contract Accounting and Reporting System is DD/S&T, Plans and Program Staff. The projected growth in the workload on this activity will require an additional 6.0 hours of 1410 time. The computing work relates to developing a system to do file maintenance and produce periodic reports on Agency contracts based upon contract type, contract subject matter, and contract financial accounting.

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4.3.6. Study of Cable Secretariat Procedures for Possible Automation

The customer for this study is the Cable Secretariat. The projected growth in the workload on this activity will require an additional 1.1 hours of 360/65 time. The computing work relates a study of the present procedures in the

Cable Secretariat with a view toward possible automation of some of the steps in the system.

4.3.7. Computer-Assisted Book Composition (EPIC)  
(Electronic Printing of Intelligence Composition)

The customer for EPIC is Office of Logistics, Printing Services Division. The projected growth in the workload on this activity will require an additional 40.0 hours of 1410 time. The computing work relates to the development of a computer system that will produce book composition text in formatted, justified form for input in machine language to electronic computing and composing equipment.

4.3.8. Credit Union Study

The projected growth in the Credit Union workload will require an additional 11.0 hours of 1410 time. The computing work relates to the investigation of the appropriateness of a computer system to maintain share and loan balances and compute interest.

4.3.9. Agency Personnel Qualifications System

The customer for the Agency Personnel Qualifications System is the Office of Personnel. The projected growth in the workload on this activity will require an additional 20.0 hours of 301 time. The computing work relates to the complete operational function of querying and searching master file.



4.3.10. Hospitalization Master

The customer for the Hospitalization Master activity is the Office of Personnel. The projected growth in the workload on this activity will require an additional 3.0 hours of 501 time. The computing work relates to revision to allow one data entry and reduce and clarify clerical procedures.

4.3.11. Project MANS

The customers for Project MANS are the Office of Personnel and OBPAM. The projected growth in the workload on this activity will require an additional 2.0 hours of 501 time and 1.0 hours of 301 time. The computing work relates to revision of reporting formats, including additional data and additional reports.

4.3.12. Insurance File

The customer for the Insurance File activity is the Office of Personnel. The projected growth in the workload on this activity will require an additional 2.0 hours of 501 time and 1.0 hours of 301 time. The computing work relates to the reduction of punched card and clerical operations and optimizing computer runs.

4.3.13. Record of Overseas Service

The customer for the Record of Overseas Service activity

is the Office of Personnel. The projected growth in the workload on this activity will require an additional 0.1 hours of 501 time. The computing work relates to the elimination of error from files and providing computer editing.

#### 4.3.14. Logistics Stock Accounting

STAT The customers for the Logistics Stock Accounting activity are OL, OC, OS, OF, TDS,  The projected growth in the workload on this activity will require an additional 20.0 hours of 1410 time. The computing work relates to the designing of a new system to meet requirements of OL. (This may be combined with MIS).

#### 4.3.15. Manufacturers Cross Reference

The customer for the Manufacturers Cross Reference activity is the Office of Logistics. The projected growth in the workload on this activity will require an additional 10.0 hours of 1410 time. The computing work relates to converting the present system to IBM equipment.

#### 4.3.16. CIA Retirement System

The customers for the CIA Retirement System are Office of Personnel and Office of Finance. The projected growth in the workload on this activity will require an additional 10.0 hours of 501 time. The computing work relates to provision for inclusion into existing personnel and pay systems and

establishing an accounting and paying mechanism for annuitants, survivors, and participants.

4.3.17. Agency Training Record (ATR)

The customer for the Agency Training Record activity is the Office of Training (Registrar). The projected growth in the workload on this activity will require no additional computer time. The computing work relates to provision for inclusion into Qualifications System by computer methods.

4.3.18. Financial Analysis Number (FAN)

The customers for the Financial Analysis Number activity are the Office of Finance and OBPAM. The projected growth in the workload on this activity will require an additional 4.0 hours of 501 time and 2.0 hours of 301 time. The computing work relates to providing additional reports for Confidential Funds by inclusion of detail obligations.

4.3.19. Vouchered Payroll

The customers for the Vouchered Payroll activity are the Office of Finance, Office of Medical Services, OBPAM, and Office of Personnel. The projected growth in the workload on this activity will require an additional 0.2 hours of 501 time. The computing work relates to the provision for

inclusion of all payroll accounting entries through the existing computer system.

#### 4.4. COMMUNICATIONS OPERATIONS SUPPORT

No increase in the present workload or new COMMO support jobs have been identified. However, this is an area in which computer support to date has been quite beneficial. Therefore, growth, though not predictable in volume, is to be expected.

#### 4.5. STATISTICAL DATA PROCESSING

The projected increase in required computer time for statistical jobs amounts to 25 hours of 7090 time and 21 hours of 1401 time per month. The three projects which account for this increase are included below.

##### Σ 4.5.1.